Non-Technical Abstract

Autologous Bone Marrow Transplantation (ABMT) is a method of treating breast cancer by giving patients very high doses of chemotherapy and then rescuing them with their bone marrow cells that have been removed and frozen. In this study, patients will be treated initially with standard doses of chemotherapy to cause a remission of their breast cancer. Then, blood cells which are capable of rebuilding patients' bone marrows will be removed from the patients' bloodstream and bone marrow. Seventy percent of these blood cells will be frozen directly and 30% will be used to separate the "stem" cells, those cells thought to be the forebearers of all other blood cells. These stem cells will be cultured with a disabled virus which carries genetic material referred to as the multidrug resistance gene (MDR-1). The virus transfers the MDR-1 gene into a portion of the patient's stem cells. The purpose of putting the MDR-1 gene into the patients' stem cells is to try to make these blood cells and their offspring resistant to the toxic effects of chemotherapy. The MDR-1 protein (Pgp) that is made from the MDR-1 gene makes cells resistant to chemotherapy by pumping the drug out of cells before the drug is able to kill the cell.

Patients are then treated with very high doses of ICE (ifosfamide, carboplatin, and etoposide) chemotherapy and then the frozen blood cells as well as the MDR-1 blood cells are given back to the patient through a catheter in a vein. It is hoped that the MDR-1 stem cells will contribute to the rebuilding of patients' bone marrows following the high-dose chemotherapy. Samples of patients' bone marrows and peripheral blood cells will be obtained at several points after the bone marrow recovers to follow the course and life span of the cells containing the MDR-1 virus. Patients who still have evidence of breast cancer or whose breast cancer returns after ABMT will be treated with taxol, a chemotherapy drug that is pumped out of cells by the MDR-1 protein. We will again follow patients' blood counts closely to determine whether the number of blood cells that contain the MDR-1 gene increases in response to the chemotherapy. Patients will be treated with taxol for as long as there is evidence of a beneficial effect against their tumor.